CRITICAL THINKING ASSIGNMENT MODULE FIVE

Classroom Tech Enhancement Analysis

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The importance of applying a framework to the classroom is not arbitrary or superfluous, it ensures opportunities are provided for assessing growth in the teaching method/pedagogy, learning activities, learning materials, and learning outcomes that are "constructively aligned" with the intention of the framework. It clarifies effectiveness within a specific definition that comes from the model: "Teaching and learning frameworks are research-informed models for course design that help instructors align learning goals with classroom activities, create motivating and inclusive environments, and integrate assessment into learning." (*Teaching and Learning Frameworks*, 2021). Using a framework for integrating technology into the classroom is just as important as applying a behavioral learning theory or cognitive framework to the classroom: "The acceptance and integration of digital technologies in formal educational practice are conceptualized, described, and validated in research using a range of models and frameworks." (Blundell et al., 2022). Effectively, utilizing a technology framework allows the educator to assess how the classroom and lessons are using 21st century tools, identify a learning or skill use goal, and outline how to incorporate technology to more effectively reach that goal.

There are numerous frameworks to apply to technology use in the classroom, but the effectiveness of frameworks diminishes when using multiple frameworks at once. Here, a case study of a semester-long source will be briefly analyzed using a single theory. Models and frameworks will be disregarded that theorize the influences on acceptance (CBAM, TAM, and UTAUT, among others), the processes that integrate digital technologies (ACOT, ICT-CFT, and TPACK, among others), and will focus on one of many frameworks (RAT, PICRAT, The Pedagogy Wheel, TIM, and Triple E, among others) that highlight on the degrees of integration of technology in the classroom. The SAMR model, developed by Dr. Puentadura in 2006, has been widely postively utilized as well as receiving several criticisms. The model is outlined in

four stages - Substitution, Augmentation, Modification, and Redefinition - that applies to the various ways technology can be used in the classroom to create novel, applicable, and effective learning experiences (*SAMR Model | / Teacher Inquiry | / Professional Learning / Enabling e-Learning - Enabling eLearning*, n.d.). Puentadura emphasizes the use as a way of analyzing where you are vs. where you want to be - as an enhancement, not as an aspirational ladder (Common Sense Education, 2016).

The SAMR is popular because it "uses plain language, is presented diagrammatically, and is readily accessible" (Blundell et al., 2022). However, it is open to interpretation, does not acknowledge the influence of context, and suggests "upward movement that is too rigid to appropriately describe the dynamic nature of using digital technologies in teaching and learning within specific contexts… prioriti[zing] transformation over enhancement and emphasi[zing] redefinition. (Blundell et al., 2022)". While Puentadura may spotlight the use of the framework as an identification tool, it has also been criticized for emphasizing teacher practices over learning. However, research has found that the model's application focuses more frequently on students' actions (Blundell et al., 2022). Research on SAMR in a district's classrooms showed its use provided "opportunities to enhance 21st century learning, transition to a learner-centered instructional environment, opportunities for immediate formative feedback, and increased efficiency and student self-direction (Varier et al, 2017 as cited in Warsen & Vandermolen, 2020)." This framework shows that when technology is intentionally integrated with the purpose of enhancing student learning, students and teachers both take advantage of guided and effective classroom and lesson amplification.

In this case study, a semester-long unit has been designed focused on student development of critical thinking skills, informed research, respectful dialogue, purposeful

technology use, and student-centered engagement. Varying forms of technology are used that range from their day-to-day comfort levels through stretching their abilities. Research shows that with intentional technology use, "students became more self-directed, independent and collaborative in the learning process, teachers could direct instructional time to assess student understanding while students were engaging in tasks" (Warsen & Vandermolen, 2020). Use of multiple media, assessment tools, sharing tools, and research tools allows the students to explore an area of interest more in depth while developing a wide range of 21st Century skills. By applying the SAMR framework to the unit, multiple stages of opportunity for skill growth and personalized learning can be identified, as well as areas of potential further technological adaptation and assessment of both the challenges of integrating technology and of the mitigation of the challenges.

Scenario Description

This classroom is composed of thirty-two tenth grade students that are on varying levels of acquaintance with each other. This is an English Language class, where the first semester is focused on expanding research skills and writing rather than on literature, which comes in the next semester. Students are immersed in technology in their daily lives outside of school, constantly using their phones to connect to each other rather than speaking face-to-face. They each have Chromebooks to use and Google Classroom is the current LMS used by the school. They are comfortable working with the digital worksheets, videos, and document platforms integrated into the Google Workspace, but have little reason or curiosity to go beyond the basic required use of searching through google, grabbing the first source that answers their question, and loosely integrating ideas. They are average students; some are more serious about learning

than others, but they are generally respectful and excitable. Students learned how to be students during the COVID-19 Pandemic, which means they are comfortable integrating technology and hybrid learning with the physical classroom, but may need some more social guidance and practice communicating face-to-face. "Enabling student-centric, constructivist paradigms has been a strong focus on the integration of digital technologies and reflects protracted emphasis on constructivist theories" (Blundell et al., 2022). Students are not used to traditional lecture-style classes, taking notes, or reading beyond a couple of pages at a time. The goal for the course is to expand on students' current technology, research, and writing skills while developing their critical thinking and creativity by taking advantage of current interests and abilities, developing relationships with their peers in a respectful manner, and creating an environment of inquiry.

<div align="center">Technology Integration Opportunities</div>

There are several opportunities in this unit to integrate technology beyond the surface level use of Google Classroom, search tools, and Chromebook utilization. The final project of the semester is a recorded presentation that will be developed over time with classroom dialogue supported by expanded research skills and social media, collaborative online notebooks, various presentation recording technology (Zoom, etc.), integration of multimedia pieces into the presentations, and peer review utilizing shared networks. Homework is another opportunity for technology integration, as online interactive coursework and multimedia is assigned. Several classes are highlighted within the unit plan below that provide examples of technology use beyond the baseline established in the scenario description. The lessons below are also labeled with S, A, M, or R to identify where in the framework each task currently sits.

The movement towards personalized learning in the classroom comes with the promise of students' greater abilities to integrate material and skills learned into their lives past their formal education. Technology is not only a tool that will only increase in its function throughout education and beyond, and it is in part the responsibility of educators to ensure students have the skills to use it effectively and responsibly. One way to do that is to integrate technology into personalized learning classrooms. Research shows that successful implementation of educational technology increases students' agency, motivation, and active involvement in the classroom: "student-centered approaches are associated with an increase in cognitive and in emotional social aspects of learning" and "there is preliminary evidence that technology supported personalized learning – implemented in a qualitatively satisfying way – has a moderate positive effect on educational outcomes." (Schmid et al., 2022). Each of the technology integration opportunities in this lesson serves to meet the students' needs to develop critical thinking & creativity, strengthen the power of inquiry, further grow as independent learners, and support skills needed for 21st century lives.

Technology integration is evident in the final project (a recorded presentation requires multimedia implementation that is to be shared and peer reviewed), but there are other, less obvious points of integration. Many of the Socratic discussions are enhanced by the use of online searches as support and evidence for discussion points, the development of a collaborative rubric using online sharing platforms, and the process of assessing classmates' work (and having your own assessed by classmates), all support how "we have to get kids to think smartly and critically, to not be so married to their initial gut reaction, to be open to proving themselves wrong. We need to create a space where kids are learning how to listen to understand, to speak to be understood, and to disagree without being disagreeable (Laskowski, 2023)". Even the daily use

of the OneNote notebook, individual choice of research topic, and online drafting tools during built-in work days allows students to work largely at their own pace on material that is highly personal, engaging, and adaptive to their needs (Schmid et al., 2022). The openness of research topic, the integration of discussion, and the wide choice students have in the technology they use for the final project all support creativity, a much-needed skill that increases confidence, allows students to explore different problem-solving abilities, and strengthens curiosity that as widely applicable throughout their lives (Shinde, 2021). Technology integration doesn't serve just to teach students how to use the tools, but it supports the processes that allow them to use it effectively throughout their lives.

<div align="center">Technology Integration Framework</div>

Applying the SAMR framework to the integration opportunities identifies several points of modification and redefinition, alongside the substitution and augmentation points. In order for the SAMR framework to be best applied, a baseline of technology use and expectations for the class has to be established (Blundell et al., 2022). The baseline has been established above in the scenario description, and the students are rather versed in the use of technology along most aspects of the classroom environment. "The SAMR model's goal is to help educators increase the functionality of their technology integration by moving students from enhanced learning to transformational learning." (Westerlin & Vogt, 2022). In this case, transformational learning is intended with the production of a presentation beyond the standard front-of-the-classroom PowerPoint recital (substitution and augmentation) and into a recorded multimedia presentation that is shared and peer assessed (redefinition). The path to the product incorporates multiple modification and transformational points as the students must apply learned research skills in the moment for Socratic discussions (modification), collaborate on assessing valid resources and

academic writing (modification), and utilize shared resources (modification). Alongside the use of technology to develop more applicable 21st century skills, there is a need to "consider how technology can be used not just as a way to deliver content, but also to strengthen relationships with … students" (Terada, 2020). The educators themselves also experience modification and redefinition in their classroom experience, as collaborative rubrics, peer assessments, and numerous formative assessment opportunities all modify a more standard assessment profile.

The baseline serves to assess whether technology use can be assessed as integrating on the Substitution, Augmentation, Modification, or Redefinition level. A substitution, in this case, would not just be uploading assignments to the Learning Management System, since that is the default for the students. In this unit, elements such as using different search engines, introducing a new tool for the same task, or learning different search terms serve as substitution. Augmentation focuses on expanding the base use with the aid of technology, and in this case using the reference lists of articles, multiple online libraries, online citation sources and resource banks can serve, along with the use of in-the-moment research skills. Modification takes the next step and moves towards creation with the support of technology, and introducing active collaborative tools, integrating multimedia, and tying in multiple creative outputs from previous lessons becomes evidence. Redefinition occurs when an outcome could not be possible without the novel and wide use of technology, and the creation of a digital presentation that incorporates multimedia, can be developed collaboratively, and can be shared across a network is a prime example.

The final project, while an example of an outcome on the highest rung on the SAMR framework (redefinition), is not as rich of an experience nor as engaging as it could be without integrating technology at lower rungs. Teaching students to use various search tools

appropriately, analyze academic papers, and explore the concept of validity may "only" be at the Augmentation stage of SAMR, but not only does it increase their critical thinking skills which are "inseparably connected with intellectual development", but it helps "form in students the abilities and skills to acquire knowledge from various sources, to analyze and systematize the information obtained", which is necessary in multiple careers and higher education (Morozova et al., 2022b). Not all learning development must take place at the highest level of a framework, and students cannot achieve that highest level (for the most part) without growing through other parts. "Blended learning management takes a variety of teaching and learning strategies and teaching materials are used according to learner differences to meet the teaching and learning objectives." (Atthachakura, 2021). It is imperative that we consider that this particular unit is designed for tenth graders, students just developing their sense of selves and autonomy in education, and who have a wide variety of skills, interests, and challenges.

There are still more opportunities to bring redefining technology use into this assignment, as one of the aspects of novel technology use includes utilizing a broader audience than the classroom and taking advantage of the social aspect of the internet. Use of individual or classroom websites to host a collaborative forum or social chat for shared resources, sharing the final presentations, and receiving more widespread feedback is one example. Expanding the Socratic discussions beyond the classroom to function outside of class time is another one. As students increase confidence in both classroom activities and technological tasks, they recognize how they can effectively utilize the online space and make a place for themselves in the broader online world.

Challenges & Mitigation

One of the benefits of integrating technology into the classroom is the ability to make the experience more student-centered. "In order to alter the level of student learning, change will only occur if there are improvements on three critical, interdependent realms: the level of content, the teacher's knowledge and skill, and student engagement" (Warsen & Vandermolen, 2020). However, there are many challenges to integrating technology into any lesson plan, and this is no exception. Many things can inhibit the growth of those realms, including individual points of view from the educator, the students themselves, physical and financial restraints, lack of resources including training, and time constraints.

Considering that "the main barriers found in research were lack of equipment and unreliable technology, poor professional development or lack of professional development, lack of time, beliefs of teachers, and lack of knowledge" (Henderson, n.d.), how do we diminish the impacts? In the case of this unit, the main barrier to successfully integrating technology rests in the teacher. The students already have access to their Chromebooks and are capable of using technology at a baseline level, and there is significant work time allotted in class to complete assignments. The teacher must be given sufficient training on the suggested technologies introduced in class, the opportunity to explore resources and find examples themselves, and the personal belief in and understanding of the benefit of the specific technology integration. These lessons can certainly be held in a below Substitution level of technology use with handwritten assignments, library use, and poster board. However, it is also imperative that the educational institution itself has the value placed on technology integration and resources to support the educator. Recommendations include providing a technology coach and one-on-one meetings

with information technology professionals to ensure the teacher has at the very least access to technology utilization support and sufficient additional power chords, as well as school and department wide professional development meetings to ensure the value of technology integration is emphasized and that the educator has peer feedback and sounding boards for ideas and concerns. When students are given the opportunity to develop applicable 21st century skills, they take it, and it is up to the educators to ensure that opportunities are provided.

Unit Plan for "Why Use Fake News"

18 Weeks
54 Classes (M/W/F schedule)
32 Students
Colorado Fall Semester 2024-2025

Classes:

1-2 (8/7 & 8/9) - Authority and Resource Intro
- *Intro with syllabus, intro of fundamental concepts and intro discussion "what is authority"*
- ==*Explanation of semester project, intro of One Note journals and setup, examples of good and bad resources (S)*==
- *Work Day - Resource lookup exercise (A)*

3-5 (8/12, 8/14, 8/16) - Research & Annotated Bibliography
- *Annotated Bibliography Intro with examples (S)*
- *Discussion around "Validity" and "Why Use Sources"*
- ==*Work Day - Group Exercise centered around Chat GPT, Wikipedia, and valid resources (A&M)*==

6-8 (8/19, 8/21, 8/23) - Making a Claim/Thesis statements
- *Intro to strong thesis statements*
- *Group discussion over What Comes First - thesis or research? (A)*
- *Work Day - Creating BIG QUESTIONS from research (M)*

9-10 (8/26, 8/28 - no Friday) Supporting Your Claim
- *Discussion around supporting your claim using evidence from valid sources*
- *Work Day - annotated bibliography research (M)*

11-12 (9/4, 9/6 - Labor Day) Academic Writing
- *Intro to academic writing/grammar review/how to use editing tools and resources (S)*
- *Work Day - collaborative re-writing exercise on turning non-academic pieces into academic pieces (M)*

13-15 (9/9, 9/11 9/13) - Research - Academic Research How-To's

- *Intro do different Research Styles/Studies, statistical analysis, vocab around academic studies (**S**)*
- *Discussion on what to look for, difficulties with research, what makes something "significant"*
- *Work Day - Find four papers with different research styles related to your topic (**A**)*

16-18 (9/16, 9/18, 9/20) Critical Analysis

- *Intro to analysis of academic papers/studies (**S**)*
- *Discussion around "What is Analysis", "How do you create ideas" (**A**)*
- *Work Day- identify main themes and make connections among several academic papers (**M**)*

19-21 - 9/23, 9/25, 9/27) Annotated Bibliography Drafts & Peer Editing

- *Intro to different technology use (zoom, etc.) and Peer Editing (**A**)*
- *Discussion - open-mindedness to peer editing/feedback, use of different tools (**M**)*
- *Work Day - Peer Editing activities and exploration of digital tools (**M**)*

22-24 (9/30, 10/2, 10/4) - 1st Quarter Ends - Annotated Bibliographies Due

- *Discussion on Growth Mindset Course from Khan Academy (**R**)*
- *Work Day - Bibliographies due before next class*
- *Reflection Day*

25-27 (10/7, 10/9, 10/11) What if You're Wrong?

- *Intro to strength in thorough research/finding opposing viewpoints (**A**)*
- *Discussion on claims using resource- choose opposite side (**M**)*
- *Work day - Researching a multimedia source to use present to class and start setting up the presentation (work during fall break as well) (**M&R**)*

Students off for a week

28-30 (10/21, 10/23, 10/25) Presenting your idea

- *Intro to Professional Presentations, rubrics and Q&A, examples provided (**A**)*
- *Discussion around what a presentation entails/brainstorming different styles, rubric discussion*
- *Work Day - turning annotated bibliography into a presentation (**M**)*

31-33 (10/28, 10/30, 11/1) What to Keep

- *Intro to prioritizing and presenting research*
- *Discussion - what makes something important to use in a presentation and discussion around peer feedback rubric (**A**)*
- *Work Day - integrating feedback into presentation and collaborative rubric finalization (**M**)*

34-36 (11/4, 11/6, 11/8) - Presentations & Feedback - "Because They Say So"

- *Presentation will be recorded either as a video or as a narrated slideshow, no more than 6 minutes in length. Each student will review three presentations. This class will be an*

intro into HOW to do it, and a review of one presentation. A rubric and feedback template will be provided. (M&R)

- *Two more presentation reviews*
- *Work Day - Feedback reflection for students, clarification, and brainstorming of integration (M&R)*

37-38 (11/13, 11/15 (Veterans Day) - Research Time Management

- *Discussion time management styles and priorities (S)*
- *Draft a theoretical study and create a timeline for it, including style of research and analysis (A&M)*

39-41 (11/18, 11/20, 11/22) - Critical Analysis Part 2

- *Intro to identification of gaslighting, false research claims, "considerations" in academic research papers (S&A)*
- *Discussion - Why disclose "considerations" or add "recommendations" (A)*
- *Work Day - Review "considerations" in research papers used for annotated bibliography (A&M)*

Thanksgiving Break

42-44 (12/2, 12/4, 12/6) Work Week for final drafts

- *Work Day - finishing up research and making connections (S&A)*
- *Work Day - draft for peer edits due EOD (S&A)*
- *Discussion - Modern Topic "big idea" discussion and identification of what to look out for to ensure a valid claim, valid resources, and gaslighting (A&M)*

45-47 (12/9,12/11, 12/13) Peer Editing & Final Drafts Due

- *Work Day - Peer edits round 1 (M&R)*
- *Work Day Peer Edits round 2 (M&R)*
- *Work Day - integrating peer edits (M&R)*

48-50 (12/16, 12/18, 12/20) - 2nd Quarter Ends - Reflection Week

- *Final Drafts due before Class - Discussion on research process, timeline, key-takeaways of the actual physical process of writing a research paper (A&M)*
- *Final discussion on Authority and validity, identify a "ridiculous topic" to defend*
- *Volunteer-based discussion/fun day - use your skills to defend your "ridiculous topic"*

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Concerns Based Adoption Model (CBAM): https://www.air.org/resource/cbam-concerns-based-adoption-model

UNESCO Information and Communication Technology Competency Framework for Teachers (ICT-FCT): https://oercommons.org/hubs/unesco

The Pedagogy Wheel: https://www.teachthought.com/technology/the-padagogy-wheel/

Passive Interactive Creative Replacement Amplification Transformation Model (PICRAT): https://citejournal.org/volume-20/issue-1-20/general/the-picrat-model-for-technology-integration-in-teacher-preparation/

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Technology Acceptance Model (TAM): https://www.sciencedirect.com/topics/social-sciences/technology-acceptance-model

Technology Integration Matrix (TIM): https://fcit.usf.edu/matrix/

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